

**Exercise 1.** Let  $X$  be a binomial random variable with mean 2 and  $n = 4$ . Find the distribution of  $X$ .

**Exercise 2.** Let  $X$  count the number of red stop lights Professor Verzani encounters on his drive to work. There are 10 lights, and assume the probability of a light being red is  $p = .3$  independent of the other traffic lights.

1. What is the expected number of red lights I encounter?
2. What is the standard deviation of the number of redlights I encounter?
3. What is the  $z$  score of 0 red lights?
4. What is the probability of 0 red lights?

**Exercise 3.** Let  $Z$  be a standard normal random variable ( $\mu = 0$ ,  $\sigma = 1$ ). Compute the following

1.  $P(Z \leq 1.23)$
2.  $P(Z = 1.23)$
3.  $P(.67 \leq Z \leq 1.67)$

**Exercise 4.** For a standard normal random variable which is greater

$$P(0 \leq Z \leq 1/2) \quad \text{or} \quad P(1/2 \leq Z \leq 3/2)?$$

**Exercise 5.** Let  $X$  be the foot length of a randomly chosen male. Assume  $X$  is normally distributed with a mean of 42 and a standard deviation of 4. Find the following

1.  $P(X < 44)$ .
2.  $P(40 \leq X \leq 45)$ .

**Exercise 6.** Find the following quantiles,  $a$ :

1.  $.80 = P(Z \leq a)$
2.  $.99 = P(Z \leq a)$

**Exercise 7.** Assume the height of females is normally distributed with mean 63 inches and standard deviation 3 inches. Find the height which is the 95th percentile.